

PLASMA SURFACE MODIFICATION AND PASSIVATION OF ORGANO-SILICATE GLASS FILMS FOR IMPROVED HARDMASK ADHESION AND OPTIMAL RIE PROCESSING

ABSTRACT OF THE DISCLOSURE

Interconnect structure having enhanced adhesion between the various interfaces encompassing an organo-silicate glass (OSG) film, for use in semiconductor devices is provided herein. The novel interconnect structure includes a non-damaged plasma-treated low-k OSG surface to enhance the adhesion of the hardmask material to the OSG surface, and an unique deposition scheme for the hardmasks in order to make the entire structure pliant towards implementing mild processing condition during the reactive ion etch patterning of the dielectric structure in a damascene and dual-damascene scheme. The methods for making a semiconductor device having an enhanced adhesion and micromasks free profiles are also provided.